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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,277	02/04/2004	Shunpei Yamazaki	740756-2710	2066
22204	7590	07/14/2006	EXAMINER	
NIXON PEABODY, LLP 401 9TH STREET, NW SUITE 900 WASHINGTON, DC 20004-2128			DUONG, KHANH B	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/771,277	Applicant(s) YAMAZAKI ET AL.	
	Examiner Khanh B. Duong	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/23/05 & 3/2/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This office action is in response to the preliminary amendment filed November 30, 2004.

Accordingly, claims 1-16 were amended and new claims 17-28 were added.

Currently, claims 1-28 are pending.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on February 23, 2005 and March 2, 2006 are being considered by the examiner.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: METHOD OF MANUFACTURING A DISPLAY DEVICE USING DROPLET EMITTING MEANS.

Claim Objections

Claim 12 is objected to because of the following informalities: line 2, after "glass", "substrates" should be singular --substrate--.

Claim 13 is objected to because of the following informalities: line 2, after "glass", "substrates" should be singular --substrate--.

Claim 26 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 16. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 17, 18, 20-24, 27 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 17, the claim recites “the droplet comprises any one of” the recited material. However, since each of the resist and wiring are different material, it is unclear and confusing how “the droplet” can comprise just any one of the recited list of materials. For example, if “the droplet” comprises “a photosensitive resist”, then such material is clearly not suitable for a wiring.

Re claim 18, lines 2 to 4, the claim recites “a paste form metal material or organic liquid solution which includes the paste form metal, a ultra-fine particle form metal material or organic liquid solution which includes the metal material”. However, since such materials are not photo resist material, it is unclear and confusing how it can be used to form a resist.

Re claim 20, see discussion above regarding claim 17.

Re claim 21, see discussion above regarding claim 18.

Re claim 22, lines 1 to 2, "the droplet" lacks antecedent basis and renders the claim unclear in scope and meaning. In addition, the claim recites "a photosensitive resist". However, since such a material is not a conductive material, it is unclear and confusing how it can be used to form a wiring.

Re claim 23, line 2, the claim recites "a photosensitive resist". However, since such material is not conductive, it is unclear and confusing how it can be used to form a wiring.

Re claim 24, see discussion above regarding claim 23.

Re claim 27, see discussion above regarding claim 17.

Re claim 28, see discussion above regarding claim 17.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyakawa (U.S. Patent No. 6,051,150).

Re claims 8 and 9, Miyakawa discloses in FIGs. 2A and 2B a manufacturing method of a display device comprising: forming a wiring, by etching an electric conductive film 17 formed on a substrate 9 to be processed, by use of atmospheric plasma processing means, wherein the

atmospheric plasma processing means comprises plasma generating means under atmospheric or the vicinity of atmospheric pressure [see col. 3, line 59 to col. 4, line 6, and col. 5, line 64 to col. 6, line 4].

Claims 1, 3, 4, 6-13, 16, 18, 19 and 21-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamazaki et al. (US 2005/0011752 A1).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Re claims 1 and 7, Yamazaki et al. (“Yamazaki”) discloses in Figs. 3(A) to 5(E) a manufacturing method of a display device comprising: forming a photoresist pattern (104-106) comprising a composition which is emitted by use of droplet emitting means 103; and carrying out plasma processing to the pattern (108-110) by use of atmospheric plasma processing means 118, wherein the droplet emitting means 103 comprises a plural droplet emitting head (e.g. 3 heads) in which a plurality of droplet emitting holes (nozzles) are disposed in a line form [see FIG. 5(c)], and wherein the atmospheric plasma processing means comprises plasma generating means under atmospheric pressure or vicinity of atmospheric pressure [see page 5, paragraph 0067 to page 7, paragraph 0088].

Re claims 3 and 18, Yamazaki discloses in Figs. 3(A) to 5(E) a manufacturing method of a display device comprising: forming a resist (108-110) by use of droplet emitting means 103;

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and ashing the resist (115-117) and etching an electric conductive film (102a-102c) which is disposed under the resist (115-117) by use of atmospheric plasma processing means 118 wherein the droplet emitting means 103 comprises a plural droplet emitting head (e.g. 3 heads) in which a plurality of droplet emitting holes (nozzles) are disposed in a line forms [see FIG. 5(c)], and wherein the atmospheric plasma processing means comprises plasma generating means under atmospheric pressure or vicinity of atmospheric pressure [see page 5, paragraph 0067 to page 7, paragraph 0088].

Re claims 4 and 19, Yamazaki discloses in Figs. 3(A) to 5(E) a manufacturing method of a display device comprising: forming a pattern (104-106) comprising a composition which is emitted by use of droplet emitting means 103, and by carrying out plasma processing to the pattern (104-106) by use of plasma processing means 118 for carrying out local plasma processing, wherein the droplet emitting means 103 comprises a droplet emitting head in which one or a plurality of droplet emitting holes are disposed [see FIGs. 5(B) and 5(C)], and wherein the plasma processing means 118 for carrying out local plasma processing comprises plasma generating means under atmospheric pressure or the vicinity of atmospheric pressure [see page 5, paragraph 0067 to page 7, paragraph 0088].

Re claims 6 and 21, see discussion above regarding claims 3 and 18.

Re claim 8, Yamazaki discloses in Figs. 3(A) to 5(E) a manufacturing method of a display device comprising: forming a wiring (102a-102c), by etching an electric conductive film 102 formed on a substrate 101 to be processed [see Fig. 5(A)], by use of atmospheric plasma processing means 118, wherein the atmospheric plasma processing means 118 comprises plasma

generating means under atmospheric or the vicinity of atmospheric pressure [see page 5, paragraph 0067 to page 7, paragraph 0088].

Re claims 9 and 22, Yamazaki discloses in Figs. 3(A) to 5(E) a manufacturing method of a display device comprising: forming a wiring (102a-102c), by etching an electric conductive film 102 formed on a substrate 101 to be processed [see Fig. 5(A)], by use of plasma processing means 118 for carrying out local plasma processing, wherein the plasma processing means 118 for carrying out local plasma processing comprises plasma generating means under atmospheric or the vicinity of atmospheric pressure [see page 5, paragraph 0067 to page 7, paragraph 0088].

Re claims 10 and 23, Yamazaki discloses in Figs. 6(C) to 6(E) a manufacturing method of a display device comprising: forming a groove in an insulating film 130b formed on a glass substrate 101; emitting a composition in the groove, by use of droplet emitting means; and forming a pattern 131 comprising the composition along the groove, for use as a wiring, wherein the droplet emitting means 103 [see Fig. 5(C)] comprises a droplet emitting head in which a plurality of droplet emitting holes are disposed in a line form [see page 7, paragraph 0094 to page 8, paragraph 0101].

Re claims 11 and 24, see discussion above regarding claims 10 and 23.

Re claims 12 and 25, Yamazaki discloses in Figs. 16(A) to 16(C) a manufacturing method of a display device comprising: forming a first thin film 151 over a glass substrates 150; forming a pattern 152a (e.g. resist) comprising a composition which is emitted on the first thin film 151 by droplet emitting means; and forming a second thin film 153 over the pattern 152a wherein the pattern is formed in a matrix form, and wherein the droplet emitting means [see Figs. 5(B) and 5(C)] comprises a droplet emitting head in which a plurality of droplet holes are

disposed in a line form [see page 15, paragraph 0195 to page 16, paragraph 0205]. Yamazaki alternatively discloses in Fig. 5(A) to form a thin film 102 over the entire surface on the substrate 101.

Re claims 13, 16 and 26, see discussion above regarding claims 12 and 25.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-7, 14, 15, 17-21, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (U.S. Patent No. 5,429,994) in view of Ogawa (U.S. Patent No. 6,871,943) and Koinuma et al. (U.S. Patent No. 5,549,780).

Ishikawa discloses in Figs. 5(a)-6(f) a manufacturing method of a display device comprising: forming a resist pattern 3 by use of droplet emitting means 222b [see also Fig. 8(b)]; and ashing the resist pattern 3 and etching the wiring 2, wherein the droplet emitting means 222b comprises a droplet emitting head [see col. 2, line 38 to col. 3, line 39].

Re claims 1 and 7, Ishikawa fails to disclose: using a droplet emitting head comprising a plurality of droplet emitting holes disposed in a line form; and using atmospheric plasma processing means to perform the steps of ashing and etching, wherein the atmospheric plasma processing means comprises plasma generating means under atmospheric pressure or vicinity of atmospheric pressure.

Ogawa expressly shows in FIG. 13 a droplet emitting head 7 comprising a plurality of droplet emitting holes ("ejection nozzles") 138 disposed in a line form [see col. 18, lines 14-53]. However, Ogawa does not teach using atmospheric plasma processing means to perform the steps of ashing and etching, wherein the atmospheric plasma processing means comprises plasma generating means under atmospheric pressure or vicinity of atmospheric pressure.

Koinuma et al. ("Koinuma") teaches that etching at atmospheric pressure adds the capability of etching a large area in an open system and does not require the evacuation of a chamber [see col. 3, lines 29-36 and col. 4, lines 34-42].

Since Ishikawa, Ogawa and Koinuma are from the same field of endeavor, the purposes disclosed by Ogawa and Koinuma would have been recognized in the pertinent prior art of Ishikawa.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method disclosed by Ishikawa by forming a droplet emitting head comprising a plurality of droplet emitting holes disposed in a line form because of the desirability to maximize the output of the droplets. In addition, it would have further been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method as combinatively disclosed by Ishikawa and Ogawa by etching or ashing under the atmospheric pressure or a pressure close to the atmospheric pressure because of the desirability to etch a large area in an open system without having to evacuate a chamber.

Re claims 2 and 17, see discussion above regarding claims 1 and 7. In addition, Ishikawa fails to disclose forming a wiring by use of droplet emitting means.

Ogawa teaches forming a metal wiring, microlenses or photo-resist by use of droplet emitting means [see col. 31, lines 18-53].

Since Ishikawa and Ogawa are from the same field of endeavor, the purpose disclosed by Ogawa would have been recognized in the pertinent prior art of Ishikawa.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method disclosed by Ishikawa by using droplet emitting means to form a metal wiring layer having a desired pattern.

Re claims 3, 4, 6, 18, 19, 21, see discussion above regarding claims 1 and 7.

Re claims 5, 14, 15, 20, 27 and 28 see discussion above regarding claims 2 and 17.

Claims 10, 11, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsushita (JP 10062814 A) in view of Ogawa.

Matsushita expressly discloses in FIG. 1 a manufacturing method of a display device comprising: forming a groove 12 in an insulating film 5 formed on a glass substrate 1; emitting a composition 10 in the groove; and forming a pattern 10a comprising the composition along the groove 12, for use as a wiring.

Re claims 10, 11, 23 and 24, Matsushita fails to disclose using a droplet emitting means to emit the composition, wherein the droplet emitting means comprises a droplet emitting head in which a plurality of droplet emitting holes are disposed in a line form.

Ogawa expressly shows in FIG. 13 using a droplet emitting head 7 comprising a plurality of droplet emitting holes ("ejection nozzles") 138 disposed in a line form [see col. 18, lines 14-53]. Ogawa further teaches to use such a droplet emitting head to form a metal wiring on devices such as a liquid crystal display device, wherein the droplet comprises a metal material [see col. 31, lines 18-32].

Since Matsushita and Ogawa are from the same field of endeavor, the purpose disclosed by Ogawa would have been recognized in the pertinent prior art of Matsushita.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method disclosed by Matsushita by utilizing a droplet emitting head as taught by Ogawa because of the desirability to selectively form a wiring.

Claims 12, 13, 16, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa in view of Matsushita and Ogawa.

Ishikawa discloses in Figs. 6(a) to 6(f) a manufacturing method of a semiconductor device comprising: forming a first thin film 2a over a semiconductor substrate 1; forming a pattern 3 comprising a composition which is emitted on the first thin film 2a by droplet emitting means; and forming a second thin film 13 over the pattern 3 wherein the pattern 3 is formed in a matrix form.

Re claims 12, 13, 16, 25 and 26, Ishikawa does not disclose: the substrate being a glass substrate; and the droplet emitting means comprises a droplet emitting head in which a plurality of droplet holes are disposed in a line form.

Matsushita teaches in FIG. 1 a liquid crystal display device comprising a glass (transparent) substrate 1. However, Matsushita does not teach the droplet emitting means comprising a droplet emitting head in which a plurality of droplet holes are disposed in a line form.

Ogawa expressly shows in FIG. 13 using a droplet emitting head 7 comprising a plurality of droplet emitting holes ("ejection nozzles") 138 disposed in a line form [see col. 18, lines 14-53]. Ogawa further teaches to use such a droplet emitting head to form a metal wiring on devices such as a liquid crystal display device, wherein the droplet comprises a metal material [see col. 31, lines 18-32].

Since Ishikawa, Matsushita and Ogawa are from the same field of endeavor, the purpose disclosed by Matsushita and Ogawa would have been recognized in the pertinent prior art of Ishikawa.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method disclosed by Ishikawa by forming a glass substrate because of the desirability to form a liquid crystal display device. In addition, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method disclosed by Ishikawa by forming a droplet emitting head comprising a plurality of droplet emitting holes disposed in a line form because of the desirability to maximize the output of the droplets.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith, can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KBD


Zandra V. Smith
Supervisory Patent Examiner
10 July 2010